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The Biologically Active Isomers of Glycyrrhetinic Acid: A Pharmacological and Clinical Appraisal of their Anti-inflammatory Action

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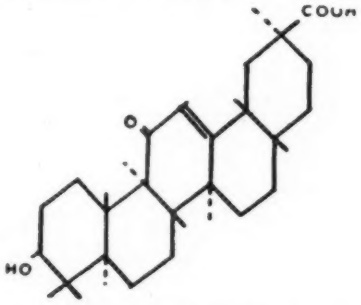
SUMMARY.—In this paper a brief account of the pharmacological properties of glycyrrhetinic acid is presented, together with its anti-inflammatory activity in laboratory animals and the results obtained during an extensive trial in veterinary practice.

Part I

Introduction

LIQUORICE has long been used in veterinary and clinical medicine, mainly as a demulcent and sweetening agent. Revers (1948) first observed its value in stomach ulcers. This was confirmed by Molhuysen *et al.* (1950) who also found it to have a deoxycortone-like action and to be of value in the treatment of Addison's disease.



Glycyrrhetic Acid
Glycyrrhetinic Acid

An important constituent of liquorice is "glycyrrhizin," a glycoside the aglycone of which is "glycyrrhetinic" or "glycyrrhetic" acid. The structure shows some resemblance to cortisone.

It does not, however, have any glucocorticoid actions, for it will not cause a depletion of liver glycogen in the mouse (Hems, 1956) or sustain adrenalectomised rats (Wenzel & Emick, 1956) or mice (D'Arcy, Kellett & Somers, 1957) submitted to a cold stress. Unlike hydrocortisone, prolonged administration does not cause adrenal atrophy, but it does cause a depletion of lipid in the zona glomerulosa (D'Arcy, Kellett & Somers, 1957) like deoxycortone, as well as causing changes in the electrolyte and water metabolism (Molhuysen *et al.*, 1950; Hassan *et al.*, 1954; Hart, 1957; Finney *et al.*, 1958).

The molecule of glycyrrhetinic acid can exist in a number of isomeric forms (Beaton & Spring, 1955), not all of which are biologically active (Colin-Jones *et al.*, 1957; Finney *et al.*, 1958; Benigni & Franco, 1958). This would explain the inconsistent findings in the early clinical trials. Adamson and Tillman (1955) first found that glycyrrhetinic acid had an action on the skin similar to that of hydrocortisone. This was not confirmed by Warin and Evans (1956), Donaldson and Duthie (1956) and Tillman *et al.* (1956), probably due to the use of inert material. Using the isomers

* *Present Address:* The Distillers Co. (Biochemicals) Ltd., Speke, Liverpool.

of glycyrrhetinic acid, which had been tested for biological activity, Evans (1956), Annan (1957), Chakravorti (1957), Sommerville (1957) and Colin-Jones *et al.* (1957) confirmed its value in a number of dermatoses in humans. Similar beneficial results have been obtained in veterinary practice (Halpin, 1956; Jackson & Jackson, 1957; Hebeler, 1957, and Phillips, 1957).

This paper gives further confirmation of the anti-inflammatory activity of glycyrrhetinic acid both in laboratory animals and in a wide variety of inflammatory conditions encountered in dogs in veterinary practice.

Experimental

In our initial experiments we endeavoured to produce on the skin of rabbits lesions resembling the dermatoses seen in man, but we soon found that the rabbits' skin behaved differently to human skin. Irritant substances produced necrotic lesions which are known to be adversely affected by hydrocortisone. Our best results were obtained by applying "teepol" followed by acetone twice daily for 4 days, when extensive indurations formed across the skin on the back. These rapidly healed following the application of glycyrrhetinic acid ointment or hydrocortisone ointment, but not with the base alone. The method, however, was hardly suitable for large-scale comparisons. The anti-inflammatory activity of different preparations of glycyrrhetinic acid and hydrocortisone were next determined on the eye of the rabbit. An inflammatory condition was induced by dropping xylene into one previously anaesthetised eye. An intense inflammation was produced in the form of an acute congestion of the conjunctival vessels, inner eyelids and the nictitating membrane. Ten minutes later the eye ointment was applied, some eyes being left untreated as controls. On the following day the eyes were inspected for the presence of inflammation and although we were able to show that glycyrrhetinic acid, like hydrocortisone, reduced the inflammation, spontaneous remissions are frequent, resulting in a low mean score in the controls. The method was therefore not pursued.

A number of methods have been described for the assessment of anti-inflammatory drugs. , These include:—

1. The cotton pellet method of Meier, Schuler and Desaulles (1950).
2. Inhibition of the tuberculin reaction in B.C.G. infected guinea-pigs (Long & Miles, 1950).
3. The rat foot test (Selye, 1949).
4. The granuloma pouch method (Selye, 1953).

None of these methods bears a close relationship to the clinical use of anti-inflammatory agents on the skin, but if a drug is active in these tests it is reasonable to accept the results as evidence that the clinical observations are true and based on a scientific foundation. Such laboratory tests also enable us to pick out active from inactive materials. We have found that certain isomers of glycyrrhetinic acid, the so-called "active isomers,"* are active in these tests, and that one commercial sample from a different source was inactive.

We now briefly describe the tests we have carried out and the results we have obtained.

1. *The Cotton Pellet Method*

Small cotton wool pellets implanted under the skin of the rat become infiltrated with granulation tissue; an anti-inflammatory agent reduces the amount of granulation tissue formed so that the weight of the pellet is less. Small cotton wool dental pellets (weighing about 5 mg.) are weighed and implanted under the skin, one in the region of each groin and axilla, 4 in each rat. These pellets are left *in situ* for 6 days and the rats are injected daily subcutaneously or intramuscularly for 6 days. The rats are then killed, the pellets are removed, extraneous tissue is trimmed off and the pellets dried in an oven at 60° C. overnight and weighed. The amount of granulation tissue formed is taken as the difference between the initial and final weight of the dried pellet. The results of a typical experiment are shown in Table I (D'Arcy, Kellett & Somers, 1957).

TABLE I

GLYCYRRHETINIC ACID : COTTON PELLET TEST DOSE RESPONSE CURVE

Treatment Dose 100 g. rat.	Granulation tissue m.g.	Standard Error mg.	Reduction per cent.¹
Controls saline	14·1	0·471	
G.A. 6.25 mg.	12·4	0·636	11·9
G.A. 12·5 mg.	11·3	0·393	19·4
G.A. 25 mg.	10·1	0·608	27·9
G.A. 50 mg.	9·4	0·649	33·1

They show that glycyrrhetinic acid does suppress the amount of granulation tissue formed, and that this suppression is linearly related to the dose of glycyrrhetinic acid injected.

2. *Inhibition of the tuberculin reaction in B.C.G. infected guinea-pig*

Cornforth and Long (1954) showed that certain fractions from extract of liquorice suppressed the tuberculin reaction in guinea-pigs which had been previously sensitised by an intradermal injection of B.C.G. vaccine. These fractions were as active as cortisone in the test and were the subject of a British Patent (713,651). The method was originally described by Long and Miles (1950) and Cornforth and Long (1957) stated that they found glycyrrhetinic acid inactive. While we accept that this may be true for the particular product they tested, we suggest that it is possible that the sample they used was itself an inactive material; indeed we ourselves have tested a commercial sample from another source and found it to be inactive in this test (Table II). This probably also accounts for the results of a clinical investigation (unpublished) obtained by Tillman *et al.* (1956) referred to by Scott (1957). Using the active isomers, however, we found that they resembled cortisone in suppressing the tuberculin reaction.

* Supplied by Biorex Laboratories Ltd.

For the test white guinea-pigs are used which have previously been sensitised by injecting intradermally 0.2 ml. of a 1 in 20 dilution of B.C.G. vaccine, 3 weeks before. These are divided into groups of 4 and injected subcutaneously 3 times daily with the preparation under test for 5 days, each group at a different dose level. On the sixth day the previously shaven guinea-pigs are injected intradermally with 0.2 ml. of tuberculin B.P. at 3-dose levels: A. 100 units per ml., B. 400 units per ml., C. 1,600 units per ml. The doses are injected into the skin of the back in a randomised order according to a 3 x 3 Latin Square design (Somers & Edge, 1947) each animal giving 3 responses at each of the 3-dose levels.

Typical results are shown in Fig. 1. They show that both cortisone and glycyrrhetinic acid G.A. "D" suppress the tuberculin reaction. Both are increasingly effective with an increase in size of the lesion and there is no difference between the glycyrrhetinic acid and cortisone in the test.

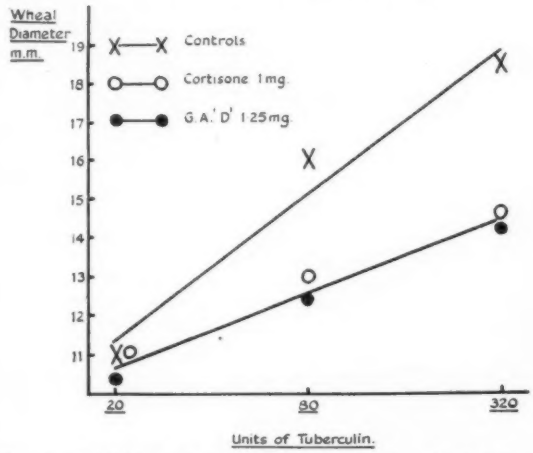


FIG. 1.—Inhibition of the Tuberculin Reaction in B.C.G.-infected Guinea-pigs.

TABLE II

THE ACTIVITY OF A COMMERCIAL SAMPLE OF GLYCYRRHETINIC ACID IN THE TUBERCULIN REACTION TEST

Treatment	Mean Wheal Diameter mm.		
	20 Units	80 Units	320 Units
Controls	7·0	9·0	12·0
Cortisone 1 mg.	6·0	6·5	8·0
Commercial Glycyrrhetinic acid 5 mg.	8·0	9·0	14·0

3. *The rat foot test*

Selye (1949) showed that the swelling produced in the foot of the rat after the injection of formaldehyde is suppressed by cortisone. He claimed that this test shows a similarity to clinical arthritis. For the experiment groups of rats are injected with the test drug at ascending dose levels over 6 days and on the last day 0.2 ml. of a 3 per cent. solution of formaldehyde is injected into the plantar aponeurosis of one of the rear feet. On the following day the volume of the injected foot is measured using a microburette as described by Buttle *et al.* (1957) and compared with the volume of the opposite uninjected foot. The mean increase in volume and its standard error is determined for each group and compared with a group of untreated controls. The results illustrated in Fig. 2 show again that glycyrrhetinic acid suppressed this pseudo-arthritic reaction.

4. *Granuloma Pouch Test*

Inflammation is produced by croton oil in a preformed subcutaneous pouch in the rat. In the

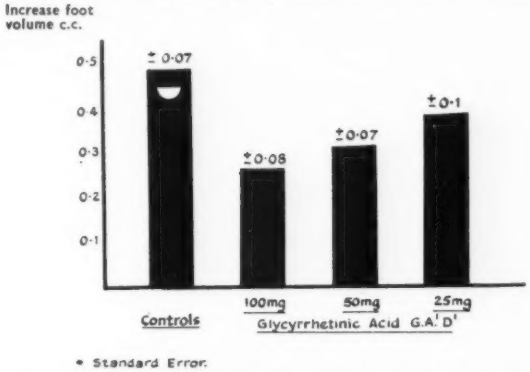
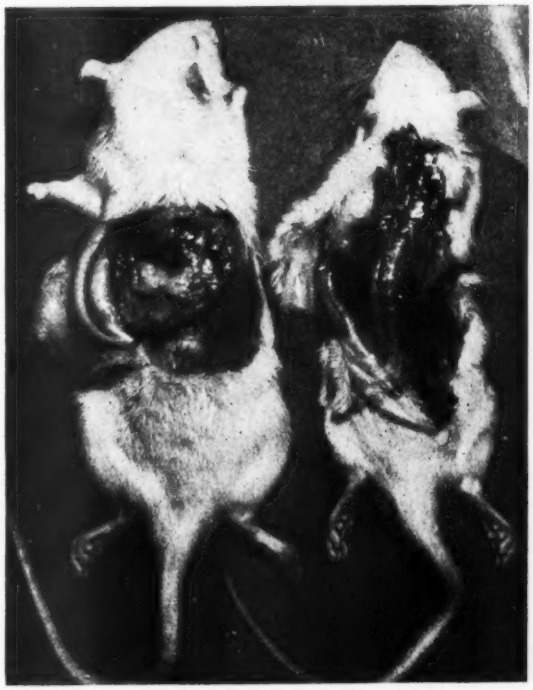


FIG. 2.—Activity of Glycyrrhetinic Acid G.A. "D" in the Rat Foot Test.



untreated treated

FIG. 3.—Glycyrrhetinic acid: granuloma pouch test.

normal rat the wall of the pouch thickens and there is an exudate of a straw-coloured or blood-stained fluid into the sac. An anti-inflammatory drug inhibits the inflammatory response, the wall remains thin, formation of inflammatory exudate is inhibited and the croton oil causes a necrosis through the skin. For the test the skin on the back of the rat is shaved and 25 ml. of air is injected subcutaneously through a fine hypodermic needle, so as to form an air sac; 0.5 ml. of a 1 per cent. solution of croton oil in arachis oil is then injected into the sac. The drug being tested is injected subcutaneously daily over 5 days and the rat killed on the sixth day when the pouch is dissected. The photographs (Fig. 3) show the results obtained with glycyrrhetinic acid. The rat on the right received four daily injections of glycyrrhetinic acid subcutaneously (12.5 mg.). The sac was thin and inflammatory exudate was absent. The rat on the left was the untreated control. Note the thickened granulomatous sac and inflammatory exudate. Six ml. of straw-coloured fluid was present in the sac. These results have been confirmed many times.

We conclude from these experiments that, providing the active isomers are used, there is very definite evidence that glycyrrhetinic acid is an active anti-inflammatory drug, and they provide a scientific foundation for the use of these isomers in inflammatory conditions. At the same time there is no evidence that glycyrrhetinic acid has any marked effect on the pituitary adrenal axis, a very definite disadvantage with the corticosteroids.

Part II

From the brief review of the pharmacology and chemistry of glycyrrhetinic acid and the experimental studies on its anti-inflammatory response, it was natural to follow through with a clinical evaluation in veterinary practice.

The detailed investigations of Dr. Colin-Jones *et al.* (1957) have shown the great value of the active isomers of glycyrrhetinic acid preparations in a variety of dermatological conditions, either alone or in combination with other drugs. These results have been confirmed by F. Quentin Evans (1958). Sir William Kelsey Fry and Dr. V. Goldman (1958) have also found that the active form of glycyrrhétinic acid is of immense value in the treatment of "dry sockets," a hitherto intractable condition.

In a brief veterinary evaluation Jackson and Jackson (1957) have shown its value in otitis externa and anal adenitis and Hebeler (1957) described some of its applications in large-animal practice. Phillips (1957) reported on its value in some aspects of small-animal practice and especially in ophthalmic conditions whilst Davies and Fairweather (1957) stated "in the few comparisons we have been able to make, glycyrrhetinic acid gave better results than hydrocortisone preparations." Halpin (1957) suggested its use in miliary eczema.

Our investigations have been carried out on products containing:—

1. 2 per cent. active isomers of glycyrrhetinic acid (Biosone G.A. Ointment).
2. 2 per cent. active isomers of glycyrrhetinic acid and 0.5 per cent neomycin sulphate (Biosone G.A. Ointment with Neomycin).
3. 2 per cent. active isomers of glycyrrhetinic acid and 1.0 per cent. neomycin sulphate (Biosone G.A. Cerate with Neomycin).
4. 2 per cent. active isomers of glycyrrhetinic acid and 2 per cent. ether soluble tar fractions (Tar-Biosone G.A. Ointment).
5. 2 per cent. active isomers of glycyrrhetinic acid, 2 per cent. ether soluble tar fractions and 2 per cent. salicylic acid (Tar-Biosone G.A. Ointment with Salicylic Acid).

These ointments have been used in small-animal practice in a variety of skin conditions, many of which had hitherto been intractable to other forms of therapy. The animals used in this trial were all dogs of both sexes and of a variety of breeds.

Many pitfalls surround a clinical investigation, especially when the product is for topical applications as so many other factors can influence the therapeutic course of a disease. A clear picture can only emerge when sufficient numbers of cases are included in the trial to give figures which can be analysed to give statistically significant results. It is also necessary in the assessment of a new drug that the investigators should be unbiased and that the trials be properly controlled against base. A veterinary appraisal has one great advantage over a human trial because the psychosomatic effect is reduced to a minimum. All these hazards were fully realised and every effort was made to assess this drug objectively. It was therefore felt necessary in the first instance to conduct a blind control trial.

Two preparations were used, the active form of glycyrrhetinic acid in an ointment base and the base alone, labelled Dermatological Ointments A and B, the code to which was enclosed in a sealed envelope. When a sufficient number of cases had been assessed, the record cards were analysed with the aid of the code. In this trial the owners of the animals were unaware that a clinical trial was in progress. They were asked to bring their animals for examination every second day, when clinical observations were recorded. The results were assessed objectively and, where practicable, subjectively. Although the owners' impressions were obtained we ourselves made the decisive judgment. The duration of treatment depended on the condition, but if there was no improvement within four days this form of therapy was abandoned. Also, if the condition did not show improvement at 4-day intervals this treatment was abandoned and final assessment made.

Assessment of Degree of Improvement

Cleared—complete resolution.

Marked Improvement—complete resolution was not obtained but the symptoms were substantially alleviated.

Some Improvement—response was apparent but the condition was not substantially alleviated.

Table III gives the results.

The value X^2 between the two preparations calculated on those showing improvement and those not showing improvement is highly significant ($X^2=7.8$,

$P < 0.01$). There is, therefore, no reason to doubt that the glycyrrhetinic acid ointment is much more effective than the base alone.

Having proved that glycyrrhetinic acid was active, we then proceeded to assess its value in combination with an antibiotic (neomycin sulphate) and have compared this with an ointment containing neomycin sulphate alone. The trial was conducted on similar lines to the one previously described. The results are summarised in Table IV.

The value X^2 was again calculated between the two preparations on those showing improvement and those not showing improvement ($X^2=10.1$, $P<0.01$). This result is highly significant.

The pattern emerging from Table IV is of utmost interest and in our opinion highly demonstrative as here we were dealing with a variety of inflammatory conditions where the inflammation was caused by bacteria or where the inflammation was potentiated by the super-imposition of a bacterial infection. The anti-bacterial agent in all cases was the antibiotic neomycin, therefore the dramatic subsidence of the inflammatory process can only be attributed to the presence of the anti-inflammatory agent and its potentiation of the action of the antibiotic. Looking at Tables I and II there can be no doubt of the proven therapeutic value and anti-inflammatory action of these biologically active fractions.

TABLE III

COMPARISON OF BIOSONE G. A. OINTMENT WITH BASE

Condition	Product	Cleared	Marked improvement	Some improvement	Worse or no change
Otitis externa	Biosone G.A.	1	2	3	3
	Base	0	1	2	6
Eczema of the body	Biosone G.A.	2	1	4	5
	Base	0	3	2	7
Conjunctivitis	Biosone G.A.	0	0	3	1
	Base	0	0	0	4
Inflamed pads due to turpentine ...	Biosone G.A.	3	1	0	0
	Base	0	0	2	2
Total	Biosone G.A.	6	4	10	9
	Base	0	4	6	19

TABLE IV

COMPARISON OF BIOSONE G.A. OINTMENT AND NEOMYCIN WITH NEOMYCIN OINTMENT

Condition	Product	Cleared	Marked improvement	Some improvement	Worse or no change
Otitis Externa	Biosone G.A. ointment with Neomycin	14	8	3	3
	Neomycin ointment	4	8	13	3
Eczema with secondary infection	Biosone G.A. ointment with Neomycin	10	8	5	1
	Neomycin ointment	0	0	8	16
Conjunctivitis	Biosone G.A. ointment with Neomycin	4	4	0	1
	Neomycin ointment	2	3	3	1
Keratitis	Biosone G.A. ointment with Neomycin	8	3	1	1
	Neomycin ointment	5	4	3	1
Balanitis	Biosone G.A. ointment with Neomycin	2	1	0	0
	Neomycin ointment	0	3	0	0
Total	Biosone G.A. ointment with Neomycin	38	24	9	6
	Neomycin ointment	11	18	27	21

TABLE V

COMPARISON OF BIOSONE G.A. CERATE AND NEOMYCIN WITH CERATE BASE AND NEOMYCIN

Condition	Product	Cleared	Marked improvement	Some improvement	Worse or no change
Anal Adenitis	Biosone G.A. Cerate with Neomycin	6	8	6	4
	Cerate base with Neomycin	1	5	10	8

We also carried out a trial in Anal Adenitis using Biosone G.A. Cerate and Neomycin and comparing it against the cerate base and Neomycin. The results are contained in Table V.

Here the value X^2 between the two preparations calculated on those showing improvement and those not showing improvement is not significant ($X^2=1.8$, $P>0.05$). When, however, we calculated the figures grouping cleared and marked improvement against some improvement and worse or no change, we find that the value X^2 between the two preparations is significant ($X^2=5.5$, $P<0.5$), showing that Biosone G.A. Cerate with Neomycin is more effective in this condition than neomycin alone.

In these cases of anal adenitis the major cause was the bacterial flora which was sensitive to the antibiotic neomycin. When, however, the bacterial flora and the inflammatory processes were attacked simultaneously, the number of cases which cleared or showed marked improvement was greatly increased demonstrating the potentiation of the action of the antibiotic by this anti-inflammatory drug.

Colin-Jones *et al.* (1957) and F. Quentin Evans (1958) demonstrated synergism in intractable eczematous conditions by the combination of the active form of glycyrrhetinic acid with the keratoplastic action of tar. We have, therefore, conducted a blind trial on a variety of eczematous patterns in an attempt to eliminate, perhaps, the psychosomatic factor which can play an important role in human medicine (Annan, 1957). The trial was conducted on the pattern described previously using an ointment containing the active form of glycyrrhetinic acid 2 per cent. and ether soluble tar fractions 2 per cent. against an ointment containing 2 per cent. ether soluble tar fractions alone. The results are shown in Table VI.

The value X^2 and the Probability Figure ($X^2=11.5$, $P<0.001$) calculated on those showing improvement and those not showing improvement demonstrates statistically that Tar-Biosone G.A. Ointment is much more effective than tar ointment alone.

The controlled trials have shown the efficacy of this form of therapy, and we have continued to use it in a variety of conditions without further controls. In addition to the preparations used in the controlled trials we have also used Tar-Biosone G.A. Ointment with salicylic acid where the keratolytic action of salicylic acid was deemed necessary. Table VII

TABLE VII

Total	Cleared	Marked improvement	Some improvement	Worse or no change
73	34	21	12	6

shows the results of treatment of other cases with the active glycyrrhetinic acid ointments.

To illustrate some brief case histories, we will quote:—

1. *Subject:* Golden Cocker Spaniel, 18 months old, bitch.

History: A typical wet eczema of the left ear flap and external canal. The bitch was of a nervous disposition, and in order to ascertain the exact cause she was anaesthetised with thiopentone and the whole aural canal examined with an auriscope. No grass seeds or other foreign bodies were found.

Treatment: The canal was cleansed with cetrimide 0.5 per cent. and Tar-Biosone G.A. Ointment applied subsequently three times daily. Resolution of the pruritus and inflammation occurred steadily over the next 5 days. There was no relapse.

2. *Subject:* Aberdeen Terrier, 5 years old, dog.

History: Suddenly and viciously attacked his feet, pulling off considerable amounts of the pads from all four feet. Prolonged examination showed no ectoparasites and no good cause for the self mutilation could be discovered. The feet were raw and bleeding.

TABLE VI

COMPARISON OF TAR-BIOSONE G.A. OINTMENT WITH TAR OINTMENT

Condition	Product	Cleared	Marked improvement	Some improvement	Worse or no change
Eczemas of various patterns ...	Tar-Biosone G.A. ointment	18	11	4	1
	Tar ointment	5	5	12	12

Treatment: Injection of 25 mg. Largactil with a maintenance dose of one 25 mg. Largactil tablet twice daily.

Dressing: Topical dressings were applied as follows:—

Left fore foot—calamine.

Right hind foot—amethocaine 1 per cent. in a non-greasy base.

Left hind foot, Right fore foot } Tar-Biosone G.A. Ointment.

The following day the dog was more relaxed but was still biting the left fore foot.

The lesions were as follows:—

Left fore foot—no change.

Right hind foot—no more damage had been done, but the lesion was still raw and inflamed.

Right fore foot, Left hind foot } Inflammation had entirely gone.

The dressings were continued for a further 24 hours when the right fore and left hind feet were healing well. The other two feet showed only slight improvement. On changing the dressing of the left fore and right hind feet to Tar-Biosone G.A. Ointment resolution was rapid.

3. *Subject:* Golden Retriever, 9 years old, dog.

History: Recurrent attacks of eczema at about 6-monthly intervals. During the last attack the lesion occurred below the ear and inside the right flap. A lesion 3½ x 2 inches was caused by scratching. After considerable search of the dog, one flea was found, and although not at the site of the injury it was still considered that the eczema was caused as a result of ectoparasites.

Treatment: A derris bath was given and the lesion dressed with cetrimide and calamine. No improvement was noted. On changing to Tar-Biosone G.A. the inflammation and resulting pruritus disappeared literally overnight, and healing commenced.

4. *Subject:* Black Cocker Spaniel, 8 years old, dog.

History: Owner complained that the dog was smelling badly.

Treatment: Although the dog was treated for a labial eczema and several bad teeth were extracted the smell still persisted and was found to be due to septic anal glands. The anal glands were evacuated, irrigated with thimerosal tincture and although this was repeated on several occasions the smell still persisted. Finally these glands were irrigated with Biosone G.A. Cerate with Neomycin and to date (8 months) there has been no recurrence.

5. *Subject:* Poodle, 2 years old, dog.

History: After being stripped the dog started to scratch the side of his face until a raw wet eczema was formed below the eye and around the right side of the face. This condition had occurred before and had caused considerable trouble.

Treatment: The face was clipped very closely and washed with 0.5 per cent. cetrimide. Biosone G.A. Ointment with Neomycin was applied 3 times a day. Within 24 hours the scratching had stopped and in 48 hours the condition had cleared.

6. *Subject:* Red Cocker Spaniel, 7 years old, dog.

History: For some time the dog had been shaking his head and holding the head on one side.

Treatment: Examination showed a purulent otitis and syringing of the ear under a general anaesthetic was advised, but the owner refused to allow anaesthesia. The ear was cleaned out with 0.5 per cent. cetrimide as far as practicable and then examined with an auroscope. The external meatus appeared ulcerated, but proper examination was impossible due to the restlessness of the dog. An eye/ear ointment containing the active isomers of glycyrrhetinic acid and neomycin was prescribed for instillation three times a day and an examination was made every second day. Some improvement was noticed by the fourth day, but no further resolution had occurred by the eighth day. The owner then permitted anaesthesia and it was found that the transverse section of the meatus was greatly thickened and almost closed. Aural resection was performed successfully.

Discussion

Experiments carried out on laboratory animals have proved that certain isomers of glycyrrhetinic acid are active anti-inflammatory agents. These active isomers incorporated into ointments (Biosone G.A. Ointment, Biosone G.A. Ointment with Neomycin and Tar-Biosone G.A. Ointment) have been found to be of undoubted value in the treatment of dermatoses of dogs in extensive veterinary trials extending to 237 cases. The effectiveness of glycyrrhetinic acid over the base has been proved in a blind trial and the difference found to be statistically highly significant. In infected dermatoses, treatment with an antibiotic is desirable, and here we have found that the combination of glycyrrhetinic acid and neomycin is superior to treatment with neomycin alone, the effect of neomycin being potentiated by the suppression of the inflammatory reaction. In certain cases a combination of glycyrrhetinic acid and tar fractions has produced a beneficial effect in otherwise recalcitrant conditions. Preparations of glycyrrhetinic acid offer to the veterinary surgeon an effective means of treatment of a wide variety of skin conditions, particularly common in small-animal practice.

From our extensive experience a few generalisations should be made.

1. Where there is exudate, the non-greasy ointment is superior to the greasy ointment. The greasy product acts as a barrier and does not mix with the exudate. The non-greasy preparation is miscible with the exudate and serum and has a desiccating effect, thus drying the lesion more quickly, reducing tissue breakdown and promoting swifter healing.

2. In conditions of weeping otitis the non-greasy ointment brings about speedier resolution.

3. The non-greasy preparation is of great value in pustular eruptions.

4. In desquamatory skin conditions and in many chronic conditions where a desiccating effect is counter-indicated, the greasy preparation is found superior.

5. In chronic conditions where pruritus is severe, Tar-Biosone G.A. Ointment is most effective.

(*Concluded on page* 808)

The President's Reception

As ever, the President's reception proved to be one of the jolliest and best attended of the social occasions during Congress week. Mr. and Mrs. Ingram received a large number of guests in the ballroom of the Villa Marina, and later moved upstairs to an informal buffet where a number of these photographs were taken. After refreshment the President and his personal guests, together with the other Officers and their ladies, returned to the ballroom where dancing continued, with great enjoyment, until a late hour. The evening was a fitting conclusion to what was, by general consent, as happy a Congress as any within recent memory.

The Hosts of the evening, Mr. and Mrs. J. M. Ingram, waiting to receive their guests.

The President for 1958-9, Mr. H. F. Hebeler, with Mrs. Hebeler are seen with the Mayor and Mayoress of Douglas.

The Deputy Governor of the Isle of Man and Mrs. Kneale are received

A correspondent in THE RECORD, writing some fifty years ago, expressed the earnest hope that members of the weaker sex would never be admitted to the profession. In his view such a thing would be unpractical, unwomanly, and altogether farouche. When this was made known to Mrs. Kelly, Mrs. Cotchin, and Miss Uvarov, all of them Members of the Royal College, they exhibited a not unnatural confusion.

XUM

The Officers for 1958-9 and their wives; left to right: Mr. and Mrs. D. F. Oliver, Dr. and Mrs. E. Cotchin, The President and Mrs. Hebeler, Mr. and Mrs. J. M. Ingram, and Mr. S. L. Hignett.

In his address to the Association Mr. Ingram referred to the hard work done by president's wives. Three ladies who have survived that ordeal very successfully are Mrs. Wilkinson, Mrs. Callender, and Mrs. Thomson.

The Treasurer is seen with the Deputy Governor and his wife and with Mrs. Cotchin.

Further Observations on the Teat Sinus of the Goat During Suckling

BY

G. M. ARDRAN, A. T. COWIE, and F. H. KEMP

Nuffield Institute for Medical Research, University of Oxford, and the National Institute for Research in Dairying, Shinfield, Reading

A DESCRIPTION of the changes in form of the teat sinus of the goat during suckling has been given (Ardran, Cowie & Kemp, 1957); these are analogous to the changes in form of a soft rubber teat when a kid is bottle-fed. The pressure changes in the lumen of the rubber teat and in the mouth during bottle feeding have been previously described (Ardran & Kemp, 1958). This paper describes the pressure changes inside the goat's teat when it was suckled by the kid.

Method

One half of the udder of a well-developed, lactating British Saanen goat was milked out. The teat of the other half of the udder was cannulated; a quantity of milk was allowed to escape and an equal amount of sterile barium sulphate suspension (Micropaque) was injected to achieve a concentration of about 25 per cent. barium suspension. The barium suspension had been previously titrated with sodium bicarbonate solution until neutral and warmed to body temperature.

The skin over the lower aspect of the left udder was anaesthetised by a local injection of lignocaine. A wide-bored needle was passed into the udder cistern and through this was passed a polythene tube. The needle was withdrawn over the polythene tube and the end of the tube was manipulated within the udder until it was within the lumen of the teat sinus close to the tip of the teat. A purse-string suture was then inserted in the skin of the udder around the tube and tightened to control the position of the tube. The polythene tube was flushed through with saline

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The Biologically Active Isomers of Glycyrrhetinic Acid—*Concluded.*

6. In lesions of the seborrhoeic type or in lesions which are covered with dead tissue, Tar-Biosone G.A. Ointment with salicylic acid is most useful.

Conclusions

The active isomers of glycyrrhetinic acid have been shown to be active anti-inflammatory agents using established methods in experimental animals. The chemistry and pharmacology have been briefly reviewed. The value of the biologically active isomers of glycyrrhetinic acid has been proven in a number of intractable skin conditions in small-animal practice, and this anti-inflammatory agent has been shown to potentiate the action of the antibiotic neomycin and also the keratoplastic agent tar. In controlled trials of 164 cases the response to the drug was shown to be highly significant. A total of 237 cases are reported and the results show that the active isomers of glycyrrhetinic acid have powerful anti-inflammatory actions and can be valuable therapeutic aids to the veterinarian.

Acknowledgments.—We are indebted to Dr. S. Gottfried of Biorex Laboratories Ltd., for the assistance given in this trial, and the generous supply of materials for these investigations; and also to Professor E. E. Turner, F.R.S. (Bedford College), who prepared the samples and gave much valuable advice.

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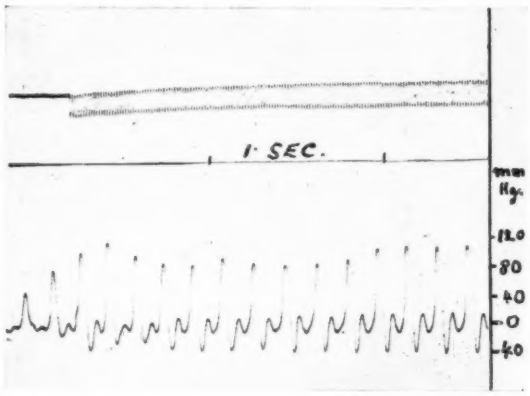
and connected to an electro-manometer of the Shillingford-Muller type; the frequency response of the system was 7 cycles per sec. A healthy, young kid goat was placed on the udder and when the animal appeared to be feeding properly the pressure in the teat was recorded together with simultaneous cineradiography at 50 frames per second. Five examinations were made on the same animal. The kid goat was then removed and the observations were repeated when the goat was hand milked by an experienced milker.

Results

Examination of the cineradiographic films showed that the kid was suckling in the manner previously described by Ardran *et al.* (1957). The pressure within the lumen of the teat rose 80 to 100 mm. Hg., during the phase of the expression of the teat sinus as it was compressed by the jaw and tongue, and fell to approximately minus 40 mm. Hg. during the refilling of the teat, and as the milk flowed from the teat orifice back into the mouth while the tongue was lowered: measurements made during bottle feeding have shown that at this phase the pressure in the back of the mouth falls to between −100 to −300 mm. Hg. The pressure rose to the base level just before the teat was again compressed (see Figure).



PRESSURE IN THE TEAT SINUS DURING SUCKLING
The upper tracing indicates the X-ray cinematograph exposures (50 frames per sec.). The positive peaks shown on the lower tracing correspond to the phase of expression of the contents of the teat by the action of the jaw and tongue. The phases of negative pressure occur during the refilling of the teat.

During hand milking the cineradiographic films showed that the index finger and thumb occluded the lumen of the udder a little more than a hand's breadth above the tip of the teat. The remaining three fingers then squeezed the teat and udder distal to the point of occlusion and most of the contents of the lumen were expelled. Relaxation of the grip of the hand then allowed the teat to refill. During the phase of expression of the contents of the udder and teat the pressure in the teat rose to more than 250 mm. Hg.

Comment

The pressure changes recorded in the above experiment are in keeping with our observations on the bottle feeding of lambs, kid goats, and human babies; they support our contention that the mechanism of suckling can be divided into two components: first, the phase of expression of the contents of the lumen of the teat sinus into the mouth by compression of the teat and adjacent mammary gland between the tongue and hard palate, and secondly, a simultaneous phase of suction due to lowering of the tongue behind the end of the teat which is continued as the mouth is being re-opened to allow the teat sinus to refill. Cineradiographic examination of the calf feeding from the cow's teat (Ardran & Kemp, unpublished) shows that the cow's teat is compressed and refills in a similar manner.

In these experiments the changes in pressure we have recorded refer only to those within the teat sinus. The changes in the basic pressure of the milk in the udder produced by variations in the hydrostatic pressure of the column of the milk and the effects of pressure changes produced by the milk ejection reflex are not considered; for in these experiments the changes in hydrostatic pressure during the few seconds in which the recordings were made were negligible. We have already emphasised that it is not feasible to perform similar experiments in woman, in whose breasts there are probably from 10 to 12 separate teat sinuses, but all the available evidence suggests that similar results would be obtained.

Acknowledgment.—We are grateful for the technical assistance of Miss M. Beard and Messrs. M. S. Tuckey and G. Smith.

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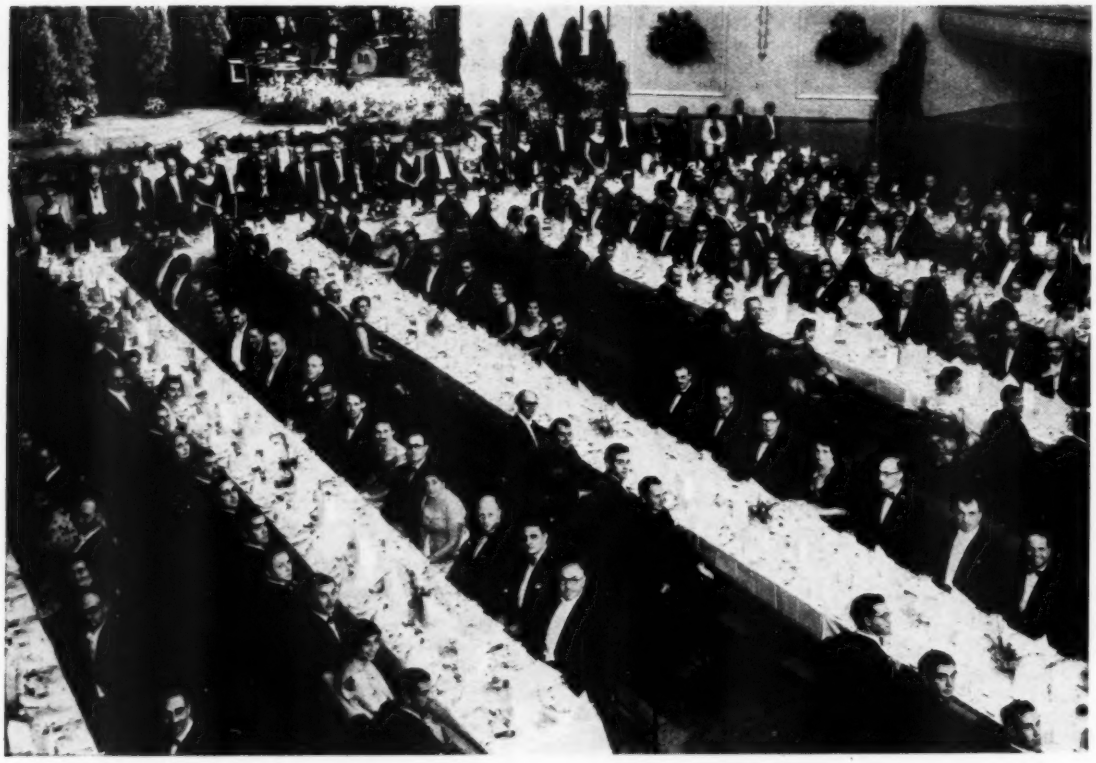
THE ROYAL COLLEGE OF VETERINARY SURGEONS

The undermentioned gentlemen were admitted to Membership of the Royal College on the dates indicated:—

BARR, Donald Arthur, 40, Cooper Avenue South, Liverpool, 19, September 26th, 1958, B.V.SC. (LIV.); DEATH, Robert Wilfred John, 25, Goring Road, Ipswich, September 26th, 1958, B.V.SC. (LIV.); DUCKER, Michael Chadwick, 31, Infirmary Road, Blackburn, September 26th, 1958, B.V.SC. (LIV.); HAYWOOD, Roger Hind, 28, Hartington Road, St. Helens, Lancs., September 26th, 1958, B.V.SC. (LIV.); MCFARLAND, Andrew Guy, 10, Fulwood Park, Liverpool, 17, September 26th, 1958, B.V.SC. (LIV.); PENHALE, William John, 193, Claremont Road, Manchester, 14, September 26th, 1958, B.V.SC. (LIV.); ROBSON, James, 10, St. Mary's Avenue, Humberstone, Leicester, September 26th, 1958, B.V.SC. (LIV.).



Some of the delegates and guests at the Annual Banquet

The Annual Banquet

A DISTINGUISHED company, representative of all branches of the profession, their ladies and their guests, dined at the Villa Marina, Douglas, Isle of Man, on September 24th. Mr. J. M. Ingram, the President, who was accompanied by Mrs. Ingram, presided, and the guest of honour was Sir Lionel Heald, Q.C., M.P. Other guests included the Mayor of Douglas, and the Deputy Governor of the Isle of Man.

After the loyal toast had been honoured, Mr. H. F. Hebeler, President-elect, in proposing the toast of "The Borough of Douglas and the Isle of Man," said, in the course of his speech:—

"It is remarkable how peoples of Celtic origin have withstood the assaults and invasions to which they have been subjected throughout the centuries, and have yet been able to throw out or absorb their invaders. It is especially noticeable in parts of Scotland and in parts of Ireland, but nowhere is it more noticeable than on this Island, which retains the Government and law of over a thousand years' foundation, a true testimony if ever there was one to the efficiency and solidarity of its people. We are proud to have among our guests to-night members of the Government of the Island.

"I am indebted to a number of authors for a study of the particular Celtic character of the Manx people. It is said that having made up their minds on any particular point, they are not easily moved from it. It is also said that they are modest and that they are hospitable. I think that this Association, remembering the firm, gentle, and steady pressure which was placed upon it to come to the Island for this Congress and having seen the wonderful welcome we have had, would agree with that estimate. Never, in my opinion, have we had so much official help, and so well given.

"In spite of their modesty, the people of the Island have taken a part in the history of Britain which should be better known. They are great sailors and many of them have won fame in the British Navy. Nelson's first lieutenant at the Battle of Trafalgar was a Manxman. The Manx people have shown a formidable record of service in two world wars. In the First World War the percentage of voluntary enlistment was the highest recorded of any of the British Islands, and the consequent heavy losses are shown on the beautiful and simple war memorial at St. John's, which I saw this afternoon, and also on the war memorial which stands on the Promenade not very far from the doors of this hall. In the last war the aerodromes and harbours of the Island provided invaluable cover to shipping using the Western Approaches. The whole keynote of the Island appears to be service to the Crown and to people.

"Many of our members will know that a certain Treasury edict with regard to something called

mileage payments has been causing a good deal of heart burning in the minds of veterinary surgeons who work for the Ministry of Agriculture. It would appear from a study of the new mileage payments that it is not going to be very long before veterinary surgeons are going around to their work on motor cycles, because that appears to offer the most favourable rate at which to drive an internal combustion engine. Should this become so, I would suggest to you, Sir, that you might perhaps invite the Association to come to the Island once a year to hold motor cycle races for members; and if during the course of the programme you should institute a race for senior Civil Servants driving 'bubble' cars over the full mountain circuit I am quite sure it would provide a very considerable draw!

"To reply to our toast to-night we welcome once again to our gathering His Worship the Mayor of Douglas, Councillor Killip. I believe that this is his last conference as Mayor and I hope that he will have happy memories of the veterinary profession."

The Mayor's Reply

The Mayor of Douglas (Councillor J. R. Killip, J.P.), in responding, said: "I should like to thank you, Sir, and this distinguished company for the very kind way in which the last toast has been proposed and so warmly received by you all. I am indebted to Mr. Hebeler for his very kind and complimentary remarks concerning our Borough and the Island. You have entertained the Mayoress and myself royally. You have lavished kindness and hospitality on us, and just when I was wondering how to thank you, you have taken the breath out of my mouth by thanking me. I can only think that in some way hidden from me we have conferred a favour upon you by having a good time as your guests at this excellent banquet. In all sincerity I am very much obliged to you for honouring this toast so handsomely, especially so because of the mutual interest which the Isle of Man has as a tourist resort with the Island's agricultural community.

"It is an undoubted truth that both of the Island's main industries are interdependent on each other. The quality products of Manx farms are an essential contribution to hoteliers and others who are engaged in catering for the thousands of holiday makers who come to our little Island every year. It hardly needs emphasising that a healthy agriculture is dependent to a very large measure upon a healthy animal population.

"We in the Isle of Man are particularly fortunate in that our geographical situation enables us the more easily to take full advantage of control of imports and exports of livestock. This factor, coupled with the benefits of veterinary science as exemplified by the professional skill of your members in Government service and private practices on the Island, has largely eradicated many of the animal diseases which one hears of as occurring in the adjacent islands from time to time."

The British Veterinary Association

The Rt. Hon. Sir Lionel Heald, Q.C., M.P., in proposing the toast of "The British Veterinary Association," said:—

Mr. E. R. Callender as a retiring officer is seen with the most newly appointed officer, Mr. S. L. Hignett, Junior Vice-President.

"I feel that it is a great privilege to propose this toast, because it enables me to pay what I believe is a tribute that ought to be paid to your Association. It is to-day a very large, a very influential, and a very important body. I understand you have 4,500 members distributed over every corner of the British Isles and you are in touch with every section of the population. One should just think of it for a moment. First of all there are the ordinary householders concerned who to-day have a most intimate and friendly connexion with the members of your Association. Connexions between you exist ranging from bull terriers to budgerigars and marmosets to mice. I am quite certain that people will have read with great satisfaction and pleasure the announcement of your intention to take particular care of the dogs which look after the blind.

"Then there is your contact with the public authorities and the local authorities where you do most important work. I know quite well that in what we call 'another place' we are going to hear something before very long about what is not done with public authorities in relation to the inspection of meat. I can say that as a result of this evening's function I shall take a very sympathetic interest in that.

"Everybody knows, or should know, of the tremendous contribution that is being made to-day to research by the veterinary bodies. After all, even in my lifetime diseases like rabies and anthrax have ceased to be a menace; and we know from your recent announcement that bovine tuberculosis will

shortly, we hope, be under control, too. But it is not only animal health that benefits from your research. I know that one of your very prominent members, someone who does a great deal of honorary work for you, Dr. Cotchin, is now regarded as one of the leading scientists in a field which we hope one day may result in dealing with what is probably the greatest scourge that the human race suffers from to-day—that of cancer. We should all be grateful for that work."

The President's Reply

The President, in responding, said: "I thank you, Sir Lionel, for the gracious and generous terms in which you have referred to this Association and for linking my name with the toast. We are very proud indeed to have you with us and we take it as a great compliment that you have spared the time to be with us when you are in this Island on Her Majesty's business. I have noted that you are a Governor of Middlesex Hospital, and you have in that capacity a link with our sister profession—I do not know whether I dare say 'the younger profession,' having regard to the fact that the centaur Cheiron, whose effigy forms the principal part of our Association's crest, was said to have given instruction to the earliest of medical men.

"Our annual banquets have been honoured on many occasions by Ministers of the Crown, but I cannot recall the last occasion when one of our principal guests had been an Attorney-General. I believe, Sir Lionel, that you are of a Lancashire family and it is therefore appropriate that the Division of our Association which is the host to this Congress should be the Lancashire Division, under its President, Mr. Harry Sumner, one of the most admired and respected members of our Association and a Past-President of the Royal College of Veterinary Surgeons.

"As I look round and see in this hall members of our profession and their wives and friends I feel how justly it can be said of the British Veterinary Association that we are more than an association in the strict sense of that term; we are a body of colleagues in cordial relations with one another. That is why I am looking forward with such keen pleasure to my Reception on Friday, when, in almost my last appearance as your President, I can shake each one of you by the hand.

"I am not sure whether it is usual, but I feel it ought to become a tradition of ours to say a word of thanks to each senior vice-President on the eve of his retirement from office. He has played an important part in our Association for three successive years with all that that entails in the way of work, thought,

The chief organisers of the Congress, the Joint Honorary Secretaries of the Provisional Committee, and their wives; left to right: Mrs. Kerruish and Mr. D. W. Kerruish, Mrs. Walley and Dr. Walley.

and anxiety. Mr. Callender will lay down the duties of the office at the end of this week, and I am sure that in expressing to him our very grateful thanks for all he has done we express also the hope that he will continue to be active in our affairs and give us for many years to come the benefit, not only of his wisdom and experience but of that kindly and generous personality which has so endeared him to us all; and I include in these remarks our appreciation of Mrs. Callender. (Applause.)

"I would say just one more word. Our profession becomes steadily more specialised and more scientific, and our annual Congresses with their papers and discussions throw that into sharp relief; but I hope we shall never forget that the basic purpose we are here to serve is the alleviation of suffering among animals. Ours is fundamentally a humanitarian task; and while I am conscious of economic and other aspects, I should like to leave in your minds the thought of putting first things first."

"The Guests"

Mr. H. Sumner, M.V.SC., F.R.C.V.S., D.V.H., Chairman, Congress Provisional Committee, in proposing the toast of "The Guests," said:—

"We have many guests here to-night from countries separated from ours not merely by the little patch of water between here and Liverpool but by oceans. All those who are far away from their native land are a group to whom, on behalf of the Association, I would bid an especial welcome. It includes Mr. Thornton and Mr. Cole from that wonderful country which is apparently destined to receive a lesson in cricket in the months that we term winter. In addition, we have here that very welcome guest, Dr. Avery from Canada; also Mr. Lambrechts of South Africa; and last but not least the ever-faithful Mr. Dayus of New Zealand. We hope that at the earliest opportunity they will convey to our professional brethren in their native lands our greetings.

"Another visitor is Colonel Dalziel. It is a fact that, but for a 'tea party' at a place called Boston in about the eighteenth century, and one or two other little spots of bother that occurred about the same time, Colonel Dalziel might quite easily have been here as a representative of a country of the Commonwealth. That he is not here as a member of the Commonwealth but as a representative of the U.S.A. Veterinary Corps makes our welcome no less. We are delighted to have him with us.

"Another visitor, and one we are very pleased to have, is Dr. Gils from Holland.

"Another group of visitors to our Congress—and here I speak with great satisfaction, great joy, and great hope—are members of the Soviet Union. We hope that their visit will prove a matter of great happiness to them and that it will be the precursor of a greater and freer exchange of visits between their country and ours. I should like them to know of the deep sincerity of our feelings on their visit. [To the general regret the Russian visitors, whose stay was a short one, were unable to accept an invitation to be present at the banquet.—*Editor.*]

"As a taxpayer and a practitioner I have to admit the desirability and some necessity of Governments and Ministries. It is a fact that no Ministry or organisation could make a happier choice to represent them than the Chief Veterinary Officer, Mr. Ritchie, and Dr. Stableforth, the Director of the laboratory from which all good diagnoses flow. Another very welcome visitor is Dr. Ross of the Ministry of Health. We are delighted to have him here.

"The British Veterinary Association covers the whole of the United Kingdom. It is therefore appropriate that we should move our meetings from place to place so as to meet our people in various parts of the country. But this nomadic existence rather puts us in a position of considerable dependence on the goodwill and the hospitality of our hosts each year. This year we have in truth been thrice blessed by the warmth of welcome we have had from the Government and Douglas.

"From the Government, we have with us the First Deemster, Mr. Kneale, and the Second Deemster, Mr. Macpherson, as well as the Government's Secretary and Treasurer, Mr. St. Aubrey Davies, and, just to keep the party in proper shape, the Secretary of the Board of Agriculture.

"From this pleasant and most hospitable town we welcome you, Mr. Mayor; Mrs. Clarke; the Town Clerk, Mr. Blakey; and the Vicar, Mr. Parr, whose welcome conduct of Divine Service on Sunday night helped to start this Congress on a proper footing."

The Reply

Mr. G. E. Moore, H.M. Attorney-General for the Isle of Man, in responding said:—

"It has occurred to me that the real interest of the British Veterinary Association in the Isle of Man is that, by now, we must be unique in that we maintain horses as a means of public transport! I think it is perhaps significant that only to-day we learn that as a result of this season's working it is only the horse-trams of Douglas which, out of its large transport system, have made a profit. That profit is made, notwithstanding the fact that there is in the horse-tram system the constant care and attention required for which veterinary surgeons are, naturally, paid!

"Your President-elect has told you that we have maintained our own laws for over a thousand years; and even this very week we are considering, through a distinguished commission of which Sir Lionel Heald is a member, whether we should not turn those laws upside down. Sir Lionel, therefore, will confirm that I can truthfully say that by circumstances beyond my control I have not had an opportunity of attending your public sessions.

"On behalf of your guests, who come from so many places, I should like to say how much we appreciate having the opportunity to be here this evening and how much we appreciate the kindly words which Mr. Sumner has said about us, and the way in which you have received the toast."

News and Comment

RUSSIAN VISITORS TO CONGRESS

Very welcome visitors to Congress were two Soviet veterinarians, with their interpreter. They were Professor Ivan Mosgov, of the Moscow Veterinary Academy, and Mr. Ivan Iladenko, director of the Ukrainian Experimental Veterinary Institute, of Kharkov. They are visiting this country for a month to study the organisation of veterinary services. When they arrived, on the Wednesday morning of Congress week, they were greeted by the President, Mr. Ingram, and were introduced to other Officers of the Association. Mr. Ingram then showed them round the commercial exhibition, which they were anxious to see, and also invited them to the banquet that evening. To the general regret our Russian colleagues were not able to accept, but they just had time to come to the informal reception beforehand and take sherry with the President. Mr. Henry Sumner, in his speech proposing the guests (reported on another page), made a happy reference to the visit which he hoped might be a portent of more numerous and longer visits in future.

Readers may recall two articles published in this journal about the work of the profession in the Soviet Union; and it is hoped, a little later on, to include at least part of the Russian veterinary literature among our Abstracts.

The President is seen with two very welcome visitors from the Soviet Union, Professor Ivan Mosgov of the Moscow Veterinary Academy, and Mr. Ivan Iladenko, director of the Ukrainian Experimental Veterinary Institute, Kharkov. On the left is their interpreter, Miss Sophie Trostyanetskaya.

ISLE OF MAN BOARD OF AGRICULTURE RECEPTION AND ENTERTAINMENT

One of the most enjoyable social evenings during Congress was that on September 25th when the members of the Isle of Man Board of Agriculture first received the Officers and a number of distinguished delegates, and then provided a dramatic and musical entertainment at the Gaiety Theatre. The latter drew a large and enthusiastic audience, which enjoyed two one-act plays, "Tony," staged by the Service Players, and "Family Album," by the Legion Players, and the admirable singing of the Manx Girls' Choir, under its conductor Mr. W. R. Prescott, who also conducted the Castle Rushen High School orchestra.

These companies of talented actors and musicians, whose reputations extend far beyond Douglas and the Isle of Man, gave very great pleasure, and the audience's thanks were expressed in a jovial speech by the President. Mr. Ingram also referred to the serious illness which had prevented the chairman of the Board, Mr. R. C. Cannell, from being present, and expressed the general hope for his speedy recovery.

The guests were received by the vice-chairman, Major E. B. C. Farrant, M.B.E., J.P., and the entertainment was under the direction of Councillor R. C. Stephen, deputy mayor of Douglas.

JURY SERVICE

The Registrar of the Royal College of Veterinary Surgeons would remind all veterinary surgeons and Supplementary Veterinary Register practitioners practising in the United Kingdom that this is the time of year to obtain exemption from jury service. *It must be emphasised that exemption from jury service is not automatic.*

Liability to jury service depends upon inclusion in the local jury book which is compiled each year from the electoral registers. On these registers the names of all persons who are, on October 10th in each year, qualified and liable to serve as jurors are marked with the letter "J."

Members have probably filled up a form recently asking them to give the names of all occupants of their households who are eligible to vote. During the period November 28th to December 12th, 1958, the lists compiled after the return of these forms will be displayd in town halls, post offices, and other public places. They may there be inspected, and if the letter "J" is marked against a member's name and he wishes to obtain exemption from jury service, he must write to the Electoral Registration Officer for his area and point out to him by not later than December 12th that he is exempt.

The authority which should be quoted in the letter is Section 24 of the Veterinary Surgeons Act, 1948, which reads:—

> "(1) No member of the Royal College of Veterinary Surgeons, and no person for the time being registered in the Supplementary Veterinary Register, shall if actually practising veterinary surgery be liable to serve on any jury.
>
> (2) This section shall not extend to Northern Ireland."

UNIVERSITY NEWS

Edinburgh

The undermentioned *external* candidates have passed in the subject of Physics of the First

Professional Examination for the degree of Bachelor of Veterinary Medicine and Surgery:—

Breton, Derek A. G.; Burney, John; David, John E.; Dobson, David J.; and Macdonald, William I.

The undermentioned *External* candidates have passed in the subject of Biology of the First Professional Examination for the B.V.M. & S. degree:—

Alexander, Richard J.; Dobson, David J.; Eden, Donald T.; Fielding, Michael J.; Gibbons, Robert W.; Harding, Clifford; Henson, Peter M.; Macdonald, William I.; Rutt, Robert C.; Thomas, Philip J. P.; Thoresen, Aase; and Wray, Clifford.

The undermentioned candidates have passed in the subject of Physics of the First Professional Examination for the B.V.M. & S. degree:—

Hall, Paul G.; Holland, Roy E.; Rowntree, Philip G. M.; and Scott, Margaret A. B.

The undermentioned candidates have passed in the subject of Chemistry of the First Professional Examination for the B.V.M. & S. degree:—

Barabas, Arpad Z.; Binnie, William D.; Cathcart, Hugh A. A.; Ede, Megeri; Jones, Alfred G.; and Morgan, John R. G.

The undermentioned candidates have passed in the subject of Biology of the First Professional Examination for the B.V.M. & S. degree:—

Frankland, Anthony L.; Gardner, Ronald E.; Grant, Kathleen A.; Linklater, Karl A.; and McLeod, Alexander P.

The undermentioned candidate has passed the Part II Examination for the Diploma in Tropical Veterinary Medicine:—

Mehanni, Saad, DIP.VET.SC. (KHARTOUM).

The Mayor and Mayoress of Douglas, Councillor and Mrs. Killip, receiving the President and Mrs. Ingram at the Mayoral reception.

THE REGISTER OF VETERINARY SURGEONS

Under the provisions of Section 17 (2) of the Veterinary Surgeons Act, 1948, the name of Mr. Michael Knightly, of 4,680, West 11th Avenue, Vancouver, 8, B.C., Canada, was restored on September 29th, 1958, to the Register of Veterinary Surgeons.

NEW PIG RECORDING SCHEME

Pig recording, at present the responsibility of the Ministry of Agriculture and the Department of Agriculture for Scotland, will be taken over by the Pig Industry Development Authority on April 1st, 1959. The authority's chairman, Sir Archibald Nye, stated in London recently that the records of the existing scheme will be accepted and retained in the new one.

The authority's scheme will be in two parts. The first, designed mainly for the pedigree breeder, will be more fully authenticated by visits to the farm by recording officers. Membership of this part of the scheme will be a condition of entry to progeny testing and only herds recorded under Part I will be considered for any future accredited herds scheme.

Part II of the scheme, in which fewer visits will be paid by the recording officers, is designed mainly for those who wish to use their records to improve their management.

A.R.C. UNDERWOOD FELLOWSHIP

Dr. Lewis E. Lloyd, Associate Professor of Nutrition in the Macdonald College of the McGill University, arrived in this country recently to take up the Underwood Fellowship awarded to him by the Agricultural Research Council to continue his studies of the metabolism of rumen micro-organisms. For the greater part of the year Dr. Lloyd will work at the Rowett Research Institute, Aberdeen.

PERSONAL

Birth

DEVONALD.—On September 28th, 1958, to Rosemary, wife of Leslie Devonald, M.R.C.V.S., 118, Melfort Road, Newport, Mon., a daughter, Ann Elizabeth.

Marriage

EVANS—SLADDEN.—On September 27th, 1958, at St. Andrew's Presbyterian Church, Canterbury, Derek Alwyn Evans, M.R.C.V.S., to Pamela Sladden. New address: "Fairbank," Calcott Hill, Sturry, Canterbury.

COMING EVENTS

October

8th (Wed.). General Meeting of the Lancashire Veterinary Association in the Veterinary Hospital, University of Liverpool, 2.30 p.m.

9th (Thurs.). Meeting of the Ayrshire Veterinary Association in the Ailsa Lounge, 2.30 p.m.

Meeting of the Lakeland Veterinary Association at the George Hotel, Penrith, 6 p.m.

10th (Fri.). General Meeting of the Midland Counties Veterinary Association at the Ministry of Agriculture Veterinary Investigation Centre, Block C, Government Buildings, Redhill, Worcester, 2.45 p.m.

General Meeting of the North of Ireland Veterinary Association at the Veterinary Research Division, The Farm, Stormont, 2.45 p.m.

General Meeting of the North of England Veterinary Medical Association in the Agricultural Lecture Room, King's College, Newcastle upon Tyne, 2.30 p.m.

14th (Tues.). Dinner-Dance of the Mid-West Veterinary Association at The Berkeley Café, Clifton.

15th (Wed.). Meeting of the Southern Counties Veterinary Society at the Royal Hotel, Winchester, 7.30 p.m.

General Meeting of the South Eastern Veterinary Association at the Royal Star Hotel, Maidstone, 2.30 p.m.

Meeting of the Scottish Metropolitan Division in the Station Hotel, Perth, 2.30 p.m.

16th (Thurs.). General Meeting of the Herts and Beds Veterinary Society at the Peahen Hotel, 14, London Road, St. Albans, 7.30 p.m.

17th (Fri.). Meeting of the Lincolnshire and District Division at the George Hotel, Grantham, 2.15 p.m.

General Meeting of the Mid-West Veterinary Society at the Berkeley Café, Clifton, Bristol, 2.15 p.m.

General Meeting of the Lincolnshire and District Division at the George Hotel, Grantham, 2.15 p.m.

18th (Sat.). Meeting of the B.S.A.V.A. Southern Region at the Royal Hotel, Winchester, 8 p.m.

22nd (Wed.). Meeting of the R.A.V.C. Division at the Home of Rest for Horses, Boreham Wood, Herts., 11 a.m.

23rd (Thurs.). Dinner-Dance of the Yorkshire Veterinary Society at the Cairn Hydro Hotel, Harrogate.

24th (Fri.). Annual Dinner-Dance of the South Wales Division at the Seabank Hotel, Porthcawl, 8.30 p.m.

25th (Sat.). Meeting of the B.S.A.V.A. North West Region in the Bull and Royal Hotel, Preston, 8.15 p.m., preceded by dinner at 7 p.m.

31st (Fri.). General Meeting of the Yorkshire Veterinary Society at the Hotel Metropole, Leeds, 2.30 p.m.

Scottish Metropolitan Division Ladies' Guild Annual Dance in the Milton House Hotel, Willowbrae Road, Edinburgh, 8 p.m.

November

19th, 20th and 21st (Wed., Thurs. and Fri.). B.V.A. Council and Committee Meetings in London.

ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax

Lanarks. Covington Mains Farm, Thankerton, Biggar (Sept. 24).

Somerset. Ham Farm, Brean, Burnham-on-Sea (Sept. 25).

Fowl Pest

Bucks. Rough Hey, Temple Wood Lane, Stoke Poges, Slough (Sept. 23); Dunromin, Rogers Lane, Stoke Poges, Slough (Sept. 24); Winchmore Hill Farm, Amersham (Sept. 25); 45, St. Pauls Avenue, Slough (Sept. 26).

Essex. Sheen Holding, Holland Road, Little Clacton (Sept. 26).

Herts. Wyddralbury Farm, Wyddral, Buntingford (Sept. 26).

Middx. Bigley, The Common, West Drayton (Sept. 27).

Norfolk. Catfitle Hall, Catfield, Stalham, Norwich; Melville House, The Street, Catfield (Sept. 23); The Meadows, Market Square, Kenninghall, Norwich (Sept. 28).

Sussex. 3, Whiteways, Rodmell, Lewes (Sept. 25); Audiburn, Broadbridge Cottages, Ashington, Pulborough (Sept. 29).

Worcs. Crestlands, Torton, Hartlebury, Kidderminster; Thirlands, Torton, Hartlebury (Sept. 23); Torton Farm, Hartlebury (Sept. 24); Duce's Orchard, Hartlebury (Sept. 26); The Hawthorns, Worcester Road, Torton, Hartlebury (Sept. 27); Backgates, Droitwich Road, Torton, Hartlebury; Bluntington Farm, Chaddesley Corbett, Kidderminster (Sept. 28).

Swine Fever

Ches. Ford Mill Farm, Bidston, Birkenhead (Sept. 25).

Essex. Mayesfield, Mayes Lane, Sandon, Chelmsford (Sept. 23); Brick House Farm, Mundon, Chelmsford (Sept 26).

Flints. Pen-ffordd-lan Fawr Farm, Lloc, Holywell (Sept. 26).

Glouc.s. Holdings 71, 72, and 73, Horton Road, Gloucester (Sept. 29).

Hants. Piggeries, Butts Lane, Throop, Bournemouth (Sept. 26); The Gillies, Fareham; 29, Parley Road, Moordown, Bournemouth (Sept. 29).

Norfolk. Eastgate, Cawston, Norwich; Cherry Orchard, Seething, Norwich; West View, Lynn Road, Southery, Downham Market (Sept. 29).

Northants. Abbott's Building, Old School Lane, Blakesley, Towcester (Sept. 25).

Suffolk. Dowsings Farm, Laxfield, Woodbridge (Sept. 24); Pear Tree House, Fressingfield (Sept. 29).

Warwicks. Brooklands Farm, Henley Road, Claverdon (Sept. 23); Oak Farm, Walmley Ash Road, Walmley, Sutton Coldfeld (Sept. 29).

Worcs. Bank Farm, Kempsey (Sept. 26).

DISEASES OF ANIMALS ACT, 1950—GREAT BRITAIN

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period		Anthrax	Atrophic Rhinitis	Foot-and-Mouth	Fowl Pest	Sheep Scab	Swine Fever
1st to 15th September, 1958		6	1	—	26	—	58
Corresponding period in	1957	2	—	1	30	—	38
	1956	33	—	19	30	—	36
	1955	21	1	—	2	—	49
1st January to 15th September, 1958 ...		112	5	114	503	—	956
Corresponding period in	1957	254	6	40	581	—	690
	1956	1,118	8	99	487	—	565
	1955	523	4	6	383	—	1,107